

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Olivier Divay, et al.

Serial No.: 10/718,042

For: AUTOMATIC INSERTION OF NON-VERBALIZED PUNCTUATION
IN SPEECH RECOGNITION

Filing Date: November 21, 2003

Examiner: Vo, Huyen X.

Art Unit: 2626

Conf. No.: 7139

	Claims Remaining After Amendment	Highest No. Previously Paid For	Present Extra	Rate	Additional Fee
Total Claims	16	- 31	= 0	X \$52.00	= \$0.00
Independent Claims	5	-7	= 0	X \$220.00	= \$0.00
Two Month Extension of Time					= \$490.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					= \$490.00

MAIL STOP AMENDMENT

Commissioner for Patents

PO Box 1450

Alexandria, Virginia 22313

Sir:

AMENDMENT

In reply to the telephone conference of Tuesday, April 14, 2009, and in further response to the Office Action mailed on August 29, 2008, please amend the above-identified Application as follows:

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IN THE CLAIMS

1. (Currently Amended) A method of recognizing punctuation in computer-implemented speech recognition in a computer having a processor responsive to instructions for performing the method of recognizing punctuation, the method comprising:

receiving the instructions by the processor, and executing the instructions for:

performing speech recognition on an utterance to produce a recognition result for the utterance;

identifying a non-verbalized punctuation mark in a recognition result including predicting the non-verbalized punctuation mark using at least one text feature and at least one acoustic feature related to the utterance;

inserting the non-verbalized punctuation mark into the recognition result; and

formatting the recognition result based on the identification of the non-verbalized punctuation mark after the non-verbalized punctuation mark has been inserted in the recognition result;

wherein the acoustic feature includes one or more of a length of a period of silence and a function of pitch of words near the period of silence, the acoustic feature including an average pitch of words near the period of silence and a function of a pitch of words adjacent to the word gap, the acoustic features based on words adjacent to the word gap including the average pitch of the words two back from the word gap and the a ratio of the average pitch of words one forward and one back from the word gap.

2-5 (Canceled)

6. (Previously Presented) The method as in claim 1 wherein the acoustic feature includes a ratio of an average pitch of words near the period of silence.

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7. (Original) The method as in claim 1 wherein formatting the recognition result includes controlling or altering spacing relative to the non-verbalized punctuation mark.

8. (Original) The method as in claim 1 wherein formatting the recognition result includes controlling or altering capitalization of words relative to the non-verbalized punctuation mark.

9. (Original) The method as in claim 1 wherein: the non-verbalized punctuation mark includes a period, and formatting the recognition result includes inserting an extra space after the period and capitalizing a next word following the period.

10. (Currently Amended) A method of recognizing punctuation in computer-implemented speech recognition in a computer having a processor responsive to instructions for performing the method of recognizing punctuation, the method comprising:

receiving the instructions by the processor, and executing the instructions for:

performing speech recognition on an utterance to produce a recognition result for the utterance;

identifying a non-verbalized punctuation mark in a recognition result including predicting the non-verbalized punctuation mark using at least one acoustic feature related to the utterance;

formatting the recognition result based on the identification;

selecting a portion of the recognition result to be corrected that includes the non-verbalized punctuation mark; and

correcting the portion of the recognition result that includes the non-verbalized punctuation mark with one of a number of correction choices, at least one of the correction choices including a change to the non-verbalized punctuation mark, the acoustic feature including an average pitch of words near

the period of silence and a function of a pitch of words adjacent to the word gap,
the acoustic features based on words adjacent to the word gap including the
average pitch of the words two back from the word gap and the a ratio of the
average pitch of words one forward and one back from the word gap.

11. (Cancelled)

12. (Original) The method as in claim 10 wherein at least one of the correction choices does not include the non-verbalized punctuation mark.

13. (Currently Amended) An apparatus comprising a computer-readable storage medium having instructions stored thereon that when executed by a machine result in at least the following:

performing speech recognition on an utterance to produce a recognition result for the utterance;

identifying a non-verbalized punctuation mark in a recognition result including predicting the non-verbalized punctuation mark using at least one text feature and at least one acoustic feature related to the utterance;

inserting the non-verbalized punctuation mark into the recognition result;
and

formatting the recognition result based on the identification of the non-verbalized punctuation mark after the non-verbalized punctuation mark has been inserted into the recognition result;

wherein the acoustic feature includes one or more of a length of a period of silence and a function of pitch of words near the period of silence, the acoustic feature including an average pitch of words near the period of silence and a function of a pitch of words adjacent to the word gap, the acoustic features based on words adjacent to the word gap including the average pitch of the words two back from the word gap and the a ratio of the average pitch of words one forward and one back from the word gap.

14-20 (Canceled)

21. (Currently Amended) A method of recognizing punctuation in computer-implemented speech recognition dictation in a computer having a processor responsive to instructions for performing the method of recognizing punctuation, the method comprising:

receiving the instructions by the processor, and executing the instructions for:

performing speech recognition on an utterance to produce a recognition result for the utterance;

identifying a non-verbalized punctuation mark in a recognition result;

determining where to insert the non-verbalized punctuation mark within the recognition result based on the identification using at least one text feature and at least one acoustic feature related to the utterance to predict where to insert the non-verbalized punctuation mark.; and

inserting the non-verbalized punctuation mark into the recognition result; wherein the acoustic feature includes one or more of a length of a period

of silence and a function of pitch of words near the period of silence, the acoustic feature including an average pitch of words near the period of silence and a function of a pitch of words adjacent to the word gap, the acoustic features based on words adjacent to the word gap including the average pitch of the words two back from the word gap and the a ratio of the average pitch of words one forward and one back from the word gap.

22-23 (Canceled)

24. (Original) The method as in claim 21 wherein the acoustic feature includes an average pitch of words near the period of silence.

25. (Original) The method as in claim 21 wherein the acoustic feature includes a ratio of an average pitch of words near the period of silence.

26. (Currently Amended) An apparatus comprising a computer-readable storage medium having instructions stored thereon and having a processor responsive to the instructions that when executed by a machine result in at least the following: receiving the instructions by the processor, and executing the instructions for:

performing speech recognition on an utterance to produce a recognition result for the utterance;

identifying a non-verbalized punctuation mark in a recognition result;

determining where to insert the non-verbalized punctuation mark within the recognition result based on the identification using at least one text feature and at least one acoustic feature related to the utterance to predict where to insert the non-verbalized punctuation mark; and

inserting the non-verbalized punctuation mark into the recognition result;

wherein the acoustic feature includes one or more of a length of a period of silence and a function of pitch of words near the period of silence, the acoustic feature including an average pitch of words near the period of silence and a function of a pitch of words adjacent to the word gap, the acoustic features based on words adjacent to the word gap including the average pitch of the words two back from the word gap and the a ratio of the average pitch of words one forward and one back from the word gap.

27-31 (Canceled)

32. (New) The method of claim 1 wherein using the text features include identifying words before and after a word gap defined by the period of silence.

33. (Cancelled)

34. (Cancelled).

35. (Currently Amended) The method of claim 32 wherein the acoustic features include a trigram adjacent to the word gap.

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REMARKS

In reply to the telephone conference of Tuesday, April 14, 2009, and in further response to the Office Action mailed on August 29, 2008, the features of claim 34 were discussed. The Examiner suggested that the features of claim 34 amended into the independent claims 1, 10, 13, 21 and 26 would serve to further the case to allowance. Independent claims 1, 10, 13, 21 and 26 are herein amended to recite features of claim 34 and antecedent claim 33. The Examiner also presented 35 U.S.C. 101 issues regarding the method claims, and language to recite tangible hardware features (i.e. a processor and memory) were agreed to be added.

If the enclosed papers or fees are considered incomplete, the Patent Office is respectfully requested to contact the undersigned collect at (508) 616-9660, in Westborough, Massachusetts.

Respectfully submitted,

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Attorney Docket No.: NUA08-23(13865-097001)

Dated: April 16, 2009